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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/615,329	07/08/2003	Hiromasa Hashimoto	223488	9373

23460 7590 10/02/2006

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EXAMINER

TUCKER, ZACHARY C

ART UNIT	PAPER NUMBER
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1624

DATE MAILED: 10/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/615,329

**Applicant(s)**

HASHIMOTO ET AL.

**Examiner**

Zachary C. Tucker

**Art Unit**

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-110 is/are pending in the application.
- 4a) Of the above claim(s) 1-41 and 94-110 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 42-93 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☒ Certified copies of the priority documents have been received in Application No. 09/939,374.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 8Jul, 24Nov03, 25 Apr 05, 22 Mar 04
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Requirement for Restriction***  
***~and~***  
***Election of Species***

A Requirement for Restriction, represented in written form, was mailed to applicants' counsel on 16 August 2006. In the reply to that Requirement, which was filed 14 September 2006, applicants indicated election of the invention set forth as Group I (claims 42-93), drawn to fused ring compounds, with traverse.

The traversal is on ground that Group II, since it is drawn to "a compound of formula I, a pharmaceutical composition comprising a compound of formula I or II, and a method of using the compound of formula I," any search and consideration of the claimed subject matter of Group I will necessarily overlap the search and consideration of the claimed subject matter of Group II. This is not found persuasive for two reasons:

First, applicants' counsel indicates the Group II claims are drawn to "a compound of formula I, a composition comprising a compound of formula I or II, and methods of using a compound of formula I," but this is not accurate. No claims in Group II are drawn to a *compound* of formula I. If there were such claims among those indicated as Group II claims, they would not have been included in that Group, but in Group I instead, which is claims drawn to chemical compounds *per se*.

Second, the search required for determination of the patentability of Group II claims, or the "search and consideration" referred to by applicants' counsel, will NOT necessarily overlap or include the search and consideration required to determine the patentability of Group I claims. This was explained at pages 3, the first full paragraph, of the Requirement for Restriction letter. In finding whether or not claims of Group II comply

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with the enablement requirement of the first paragraph of 35 U.S.C. 112, the examiner must survey the medical literature to ascertain the “state of the art” in therapeutic utility/application of hepatitis C virus polymerase inhibitors. This part of the search, necessary in the examination of Group II claims, is NOT required in surveying the chemical literature for simple disclosures of compounds. So, the search and consideration of Group II claims is not overlapping with that of Group I claims.

In the other prong of the traversal argument, applicants’ counsel cites M.P.E.P. § 803, where the examiner is directed to search and examine the entire application, even if independent and/or distinct inventions are claimed therein, if doing so would not be a serious burden on him. Applicants’ counsel goes on to say that examination of the entire application would not constitute a ‘serious burden.’

According to the MPEP §803, however, “...a serious burden on the examiner may be *prima facie* shown if the examiner shows by appropriate explanation of separate classification, or separate status in the art, or a different field of search as defined in MPEP § 808.02. That *prima facie* showing may be rebutted by appropriate showings or evidence by the applicant.” Applicant has made no rebuttal of the examiner’s showing of separate classification and separate status in the art. Thus, a serious burden has been established.

The requirement is still deemed proper and is therefore made FINAL.

Claims 1-41 and 94-110 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to nonelected inventions, there being no allowable generic or linking claim.

In the Requirement for Restriction letter, a further requirement was set forth, for applicants to elect a species of the invention which was elected, for examination purposes.

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In response to the election of species requirement, applicants indicated the compound 2-[2-(2-biphenyloxymethyl)-5-furyl]-1-cyclohexylbenzimidazole-5-carboxylic acid, which is specified in instant claim 91, as the 201<sup>st</sup> named compound therein.

A search was begun, based on the structure of the elected species compound. First benzimidazole compounds were searched and no prior art anticipating or rendering obvious any such claimed compound was found, whereupon the search was broadened, and no art was found. The search was further broadened, eventually the entire scope of claims 42-93 was searched, and no prior art anticipating or rendering obvious any compound set forth therein was found.

Upon allowance of the subject matter of the elected Group, the withdrawn claims will be eligible for rejoinder and the Requirement for Restriction between Groups I, II and III will be WITHDRAWN, and at such time the traversal of the Requirement for Restriction will be a moot issue. The conditions for rejoinder have not presently been met, as the claims of the elected Group are not patentable, for the following reasons:

#### ***Obviousness-Type Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to

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be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 42, 44, 47, 48-51, 53, 54, 56-58, 60, 61, 64, 68-73, 74, 76, 79-88 and 90 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 7,112,600. Although the conflicting claims are not identical, they are not patentably distinct from each other because the compound according to claim 1 of the patent is embraced by instant claim 42. Were claim 1 of the patent prior art, it would render instant claim 42 unpatentable as anticipated.

The compound of claim 1 of the patent is embraced by instant claim 42 wherein the central fused ring moiety is benzimidazole; R<sup>2</sup> is carboxy; ring Cy' is cyclohexyl; ring A' is phenyl; Y is option (17), wherein m and n are both zero, R<sup>a15</sup> is option (6') wherein n and w are both zero and ring B' is phenyl, while R<sup>a16</sup> is hydrogen; ring B is phenyl; w is one and Z is Group D, with Group D being halogen (fluoro).

Claims 68-73 are included in this obviousness-type double patenting rejection because those claims further modify an optional element of the compounds according to claim 42, the Group D.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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Claims 42-93 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 42, the definition of variable “Y,” the 17<sup>th</sup> alternative, there are further variables defined,  $R^{a15}$  and  $R^{a16}$ . In alternative 6’ of these further definitions, the statement “...wherein  $n'$ , ring  $B'$ ,  $Z'$  and  $w'$  are the same as the above-mentioned  $n$ , ring  $B$ ,  $Z$  and  $w$ , respectively and may be the same as or different from the respective counterparts.” This language appears to be self-contradictory and therefore presents logical problems in its interpretation. The variables are first characterized as having the same definitions as the corresponding non-primed variables of the same letter, and then immediately following that statement, it is specified that the prime-noted variables may be *different* from those corresponding non-prime variables. Either the definitions are the same or they are different, they cannot be both the same and different. If the variables  $n'$ , ring  $B'$ ,  $Z'$  and  $w'$  are different than  $n$ , ring  $B$ ,  $Z$  and  $w$ , then the definitions need to be supplied. It is also not exactly clear what applicants intend for the phrase “their respective counterparts” to signify.

The phrase “...wherein  $n'$ , ring  $B'$ ,  $Z'$  and  $w'$  are the same as the above-mentioned  $n$ , ring  $B$ ,  $Z$  and  $w$ , respectively and may be the same as or different from the respective counterparts” is repeated in claim 74, which depends from claim 42.

Claims 14-21 and 23-25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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Claims 42-93 are further indefinite, in addition to reasons given above, because the term “heterocyclic group,” which is repeated twenty times throughout claim 42, is not sufficiently defined in all cases. A few of the recitations of “heterocyclic group” are followed by language along the lines of “having 1 to 4 heteroatom(s) selected from an oxygen atom, a nitrogen atom and a sulfur atom.” Most of the recitations of the term, however, are not defined at all – these are, in claim 42, alternative (6) in the definition of “Z,” sub-definitions (5”) and (6”) in alternative (h); sub-definitions (7’) and (8’) in alternative (j); alternative (k); sub-definitions (5’) and (6’) in alternative (l); sub-definitions (5’) and (6’) in alternative (m); alternative (n); alternative (p); and alternative (q) – all in the definition of Group D.

Claim 74, which depends from claim 42, also includes several recitations of “heterocyclic group,” so that claim is further indefinite for the recitations of “heterocyclic group” therein as well.

Those of ordinary skill in the art of organic chemistry accept more than one definition of the general term “heterocyclic” or “heterocycle”.

Some consider cyclic organic compounds wherein at least one carbon atom is replaced by sulfur, oxygen or nitrogen to be heterocyclic compounds, while others of ordinary skill include selenium, tellurium, boron or tin containing rings to be within the scope of the term “heterocyclic” as it is commonly used, and some definitions of “heterocyclic” do not require carbon to present at all.

The examiner directs applicants’ attention to the following three references:



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On page 200 of the McGraw-Hill Dictionary of Chemical Terms, the definition of “heterocyclic compound” is a compound in which the ring structure is a combination of more than one kind of atom.

On page 490 of the Concise Encyclopedia Chemistry, the definition of “heterocycles” is cyclic hydrocarbon compounds in which the ring consists of carbon and at least one other element, usually, N, O or S. The definition goes on to explain that the possibilities for synthesis are nearly unlimited, and that compounds wherein the heteroatoms are of elements like phosphorous, arsenic, selenium, and tellurium are being incorporated with increasing frequency.

On page 594 of Hawley’s Condensed Chemical Dictionary, “heterocyclic” is defined as a closed-ring structure, usually, either 5 or 6 members, in which one or more of the atoms in the ring is an element other than carbon, e.g. sulfur, nitrogen, etc.

These three definitions should make it abundantly clear that there is no one specific and exact definition of the word “heterocyclic,” thus when this term is present as a claim limitation, the metes and bounds of protection are not pointed out and distinctly claimed. Though the three above-cited definitions of the term have some shared aspects, chemists of ordinary skill would not necessarily agree on the full scope and meaning of the term “heterocyclyl.”

Applicants may argue that “heterocyclic group” has been fully defined in the specification, and therefore the requirements of 35 U.S.C. 112, second paragraph, have been met with respect to claim 42.

The examiner would respond by pointing out the fact that while it is proper to use the specification to interpret what the applicant meant by a word or phrase recited in the

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claim, it is not proper to read limitations appearing in the specification into the claim when these limitations are not recited in the claim. See *In re Paulsen*; 30 F.3d 1475, 1480, 31 USPQ2d 1671, 1674 (Fed. Cir. 1994); *Intervet America Inc. v. Kee-Vet Lab. Inc.*, 887 F.2d 1050, 1053, 12 USPQ2d 1474, 1476 (Fed. Cir. 1989).

In the specification, at pages 97-101, a long list of “preferably,” “particularly preferably,” “examples of” and “examples include” with respect to the identities of what constitutes a “heterocyclic group” in the context of the present invention are disclosed. None of these teachings limits the identity of the heterocyclic group, they are non-limiting, exemplary. Amendment of claims 42 and 74 so that all recitations of “heterocyclic group” or any related term are followed by some limitation on the number of and types of heteroatoms would overcome the indefiniteness rejection based on “heterocyclic group.”

Since claims 43-93 all depend either directly or indirectly from claim 42, all claims 44-93 are indefinite because they incorporate limitations of an indefinite claim. Thus, all claims 42-93 are included in this rejection.

Claim 59, in addition to being indefinite because it depends from an indefinite base claim, is further indefinite because it is not understood which substituents the language of the claim refers to. Specifically, it cannot be determined if the claim is stating that the identity of Group A is one selected from the Markush group recited in that claim, or if the substituent which is *substituted by* Group A is a substituent which is *already* substituted by one moiety selected from the Markush group recited in the claim.

#### ***Claim Objections***

Claim 59 is objected to for a misspelled word, “optional,” in addition to being rejected for indefiniteness.

***Information Disclosure Statements***

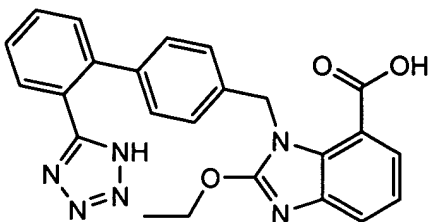
Signed and initialed PTO forms 1449 which accompanied the Information Disclosure Statements (IDS) filed 8 July 2003, 24 November 2003, 22 March 2004 and 25 April 2005 are enclosed herewith. Several references have not been considered, and citations therefor have been lined through, on the PTO 1449 form that corresponds to the 8 July 2003 IDS. These are item "AM" on page 1, items "BG," "BH," "BI," "BJ" and "BK" on page 2 and items "BL," "BM" and "BN" on page 3. These references were not found in the application file wrapper of the parent application to the instant application, serial number 09/939,374. If applicants kindly provide replacement copies of these references and a new PTO 1449 form whereon they are cited, the examiner will gladly consider them and indicate as much on the new PTO 1449 form.

***Allowable Subject Matter***

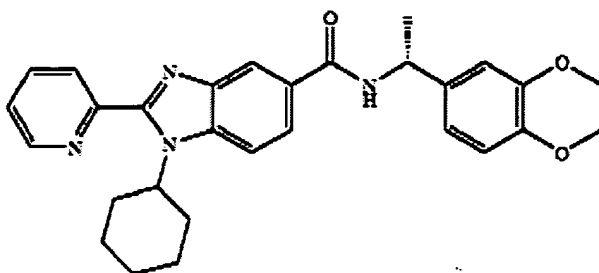
Claims 42-93 would be allowable if rewritten or amended to overcome the rejections under 35 U.S.C. 112, second paragraph, and the judicially created doctrine obviousness-type double patenting, which are set forth in this Office action.

As indicative of the closest prior art with respect to the compounds of the present invention, the examiner would cite US 5,605,919 (Matsumori et al), which discloses benzimidazole antiviral compounds, one of which is the compound 2-ethoxy-1-[[2'-(1H-tetrazol-5-yl)biphenyl-4-yl]methyl]benzimidazole-7-carboxylic acid (preparation Example 1), having this molecular structure:

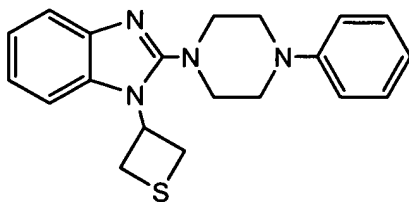
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and US 6,448,281 (Beaulieu et al), which is cited by applicants in the IDS filed 8 July 2003, which discloses the compound 1-cyclohexyl-2-pyridin-2-yl-1H-benzimidazole-5-carboxylic acid [(R)-1-(3,4-dimethoxyphenyl)-ethyl] amide, which has this molecular structure (col. 37):



and Khaliullin et al, "Synthesis of biologically active derivatives of Xanthine and benzimidazole" Bashkirskii Khimicheskii Zhurnal, vol. 4(4), pages 59-62 (1997) AS ABSTRACTED BY CAPLUS – STN, which discloses a compound having the structure according to this diagram:



Khaliullin et al is particularly close prior art. Were it not for the diazine ring at the 2-position on the benzimidazole ring system being fully saturated (as opposed to being aromatic – in which case it would be a pyrazine ring) the compound would anticipate at least instant claim 42. The full reference, has been requested from the U.S.P.T.O. library.

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Before finally indicating allowable subject matter in the instant application, the examiner must review the reference and may possibly have the reference translated from the Russian.

Upon rejoinder of the presently withdrawn claims, the examiner will likely find claims drawn to "therapeutic agents," "anti-hepatitis C virus agents" and "hepatitis C virus polymerase inhibitor" to be duplicate claims, or alternatively to be indefinite as it is not clear whether those claims are drawn to pharmaceutical compositions or to compounds *per se*. The "therapeutic agent" claims would likely be found further indefinite because it is not specified what the "agent" is "therapeutic" for.

It is recommended that the claims drawn to a method of inhibiting "hepatitis C virus polymerase" be amended to recite a method of inhibiting "RNA-dependent RNA polymerase of hepatitis C virus" instead, because there are more than one type of "polymerase" expressed by the hepatitis C virus.

### ***Conclusion***

Any inquiry concerning this communication should be directed to Zachary Tucker whose telephone number is (571) 272-0677. The examiner can normally be reached Monday to Friday from 5:45am to 2:15pm. If Attempts to reach the examiner are unsuccessful, contact the examiner's supervisor, James O. Wilson, at (571) 272-0661.

The fax number for the organization where this application or proceeding is assigned is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-1600.

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